

Thermo Environmental 49i Primary Standard with input/output interface circuit or equivalent.

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GENERAL SPECIFICATIONS:

- The calibrator must utilize the ultra-violet(uv) photometric technique as specified by the United States Environmental Protection Agency (USEPA) for use with ambient ozone monitoring.
- The calibrator must have a symmetrical optical system with a single ultra-violet radiation source serving dual absorption cells with independent detectors for each cell allowing simultaneous zero and sample measurement.
- Sample flow through absorption cells must be capillary controlled and monitored using electronic flow sensors.
- Calibrator must have an internally mounted AC operated pump.
- Calibrator must be microprocessor controlled.
- Calibrator must have internal diagnostics software to test and display operational variables such as: optical bench temperature, bench lamp temperature, ozone generator lamp temperature, sample flow through each cell, zero background and span coefficient (calibration values), averaging interval, temperature correction status and value, pressure correction status and value, date and time, ultra-violet lamp voltage, lamp intensity for each cell, + and - 15 VDC and +5 VDC power supply voltage, A/D converter frequencies, and internal option switch settings.
- Calibrator must have at least two independent analog voltage outputs with the ability to adjust zero and span of each respective output. Outputs must be capable of measuring at least 5% of full-scale over/under range. Outputs should have 12 bit resolution or better.
- Calibrator shall have a software controlled analog output test function to provide accurate analog outputs for the purpose of testing/calibrating attached strip chart recorders and/or data logging devices.
- Calibrator must be furnished with a software operating system such that any operation that can be performed from the front panel can also be performed remotely via software commands. Software shall be capable of operating any similar series calibrator or analyzer produced by vendor.
- Calibrator shall be furnished with minimum of two bi-directional RS 232 serial connectors for communicating with the calibrator, another like series calibrator or analyzer, or a free standing data logging device. RS 232 port to be configured such that like series analyzers or calibrators can be daisy-chained to allow one modem interface to be used to access any instrument in the chain.
- ***Calibrator must be capable of remote operation utilizing a rear panel input/output connector (DB25) and external switch closures. End-user furnished switch closures (1, 2, 3, 4, 5) will result in the generation of calibration ozone concentrations at USEPA designated calibration levels 1, 2, 3, 4, and zero respectively.***

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- Calibrator must have temperature and pressure compensation that can be toggled on/off via front panel controls or remote command.
- Calibrator shall be capable of producing output ozone concentrations of 0.025 parts per million (ppm) to 1.000 ppm at flows of 3.0 to 4.0 liters per minute.
- Calibrator shall be capable of operating properly within a temperature Range of 0.0 to 45.0 degrees Celsius.
- Furnishing vendor shall provide at least one copy of a comprehensive Operator's Manual with each unit purchased. Manual shall include operating instructions, calibration procedures, maintenance and trouble-shooting procedures, and electronic schematics for all electronic boards and sub-assemblies.

TECHNICAL SPECIFICATIONS (PHOTOMETER):

- RANGES: 0 – 50, 100, 200, 500, 1000, 2000, and 5000 Parts per billion (ppb) / 0 – 100, 200, 500, 1000, 2000, 5000, and 10000 micrograms per cubic meter (mg/m³) plus two operator adjustable custom ranges..
- TIME CONSTANT: User selectable 10, 20, 30, 60, 90, 120, 180, 240, or 300 seconds.
- OPERATING TEMPERATURE: 0.0 to 45.0 degrees Celsius.
- SAMPLE FLOW RATE: 1.0 to 3.0 Liters per minute.
- RESPONSE TIME: (0-95%) 20 Seconds or less.
- LAG TIME: 10 Seconds or less
- LOWER DETECTABLE LIMIT: 1.0 ppb or less.
- NOISE (Zero): 0.25 ppb RMS or less (@ 60 sec averaging time).
- PRECISION: 1 ppb (500 ppb range) or better.
- LINEARITY: +/- 1.0% of full scale or better.
- POWER REQUIREMENTS: 100 Volts AC, 115 Volts AC, or 220-240 Volts AC, all at 50-60 Hertz.
- POWER CONSUMPTION: 150 watts or less.
- ANALOG OUTPUTS: At least two independent, voltage selectable, analog outputs with user selectable 0-100mv, 1V, 5V, 10V full-scale.
- SERIAL PORTS: At least two bi-directional RS232 serial interface connections with baud rate of 1200 – 115200, data bits, parity, stop bits, protocols: C-Link, MODBUS, and streaming data (all user selectable).
- DIGITAL OUTPUTS: 1 power fail relay Form C, 10 digital relays Form A, user selectable alarm output, relay logic, 100mA @ 200VDC.

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- DIGITAL INPUTS: 16 Digital inputs, user select programmable, TTL level, pulled high.
- ETHERNET CONNECTION: RJ45 connector for 10 Mbs Ethernet connection, static or dynamic TCP/IP addressing.
- WEIGHT: Not to exceed 35 pounds.
- WARRANTY: Minimum of one year, parts and labor.

TECHNICAL SPECIFICATIONS (OZONATOR):

- OZONE OUTPUT: 25 to 1000 Parts per billion (ppb) or better at a delivery flow rate of 3.0 to 4.0 liters per minute.
- RESPONSE TIME: 1 minute or less to reach 99% or within 4 ppb of final value, whichever is greater.
- STABILITY: +/- 4 ppb or +/- 1% of reading, whichever is greater.